



Test Procedure for the NCV47411PAAJGEVB Evaluation Board

The NCV47411 is dual channel adjustable Low Dropout Regulator with:

- Two adjustable output voltages from 3.3 V to 20 V
- Two adjustable current limits up to 150 mA
- Enable inputs with 3.3 V Logic compatible thresholds

Power supplying of the chip is possible from one or two independent sources. **INPUT1** must be always supplied and **INPUT2** as optional for V_{in2} supply.

1. Power supplying

a. Power supplying from one source

Connect the test setup as is shown in **Figure 1** (See **Table 1** with required equipment). Connect power supply to **INPUT1** connector **J₁** (Power supplying of **INPUT2** is not needed).

- **Hi_F** – Positive Force line
- **Hi_S** – Positive Sense line
- **Lo_F** – Negative Force line
- **Lo_S** – Negative Sense line

Connect V_{in2} pin to **INPUT1** via appropriate position of jumper “ **V_{in2} to IN1 or IN2 connection**”.

b. Power supplying from two sources

Connect the test setup as is shown in **Figure 1** (See **Table 1** with required equipment). Connect two power supplies to **INPUT1** connector **J₁** and to **INPUT2** connector **J₂**, respectively.

- **Hi_F** – Positive Force line
- **Hi_S** – Positive Sense line
- **Lo_F** – Negative Force line
- **Lo_S** – Negative Sense line

Values of input voltages V_{in1} and V_{in2} can be different. This option is suitable for reducing of power dissipation on chip.

Connect V_{in2} pin to **INPUT2** via appropriate position of jumper “ **V_{in2} to IN1 or IN2 connection**”.

2. Connect jumpers **J₁₀ – J₁₃** for output current limitation from **V_{out1}** pin and **J₂₀ – J₂₃** for output current limitation from **V_{out2}** pin.

- **J_{n0}** – $I_{LIMn0} \sim 10 \text{ mA}$
- **J_{n1}** – $I_{LIMn1} \sim 50 \text{ mA}$
- **J_{n2}** – $I_{LIMn2} \sim 100 \text{ mA}$
- **J_{n3}** – $I_{LIMn3} - R_{CSOn3}$ positions available for individual current limit setting by resistor from range 850 Ω to 12.75 k Ω

3. Set Input Voltage and turn on Power Supply/Supplies.

4. Enable output of the channel to power the regulated output voltage by connecting the **ENABLE** pin to corresponding V_{in} via jumper. Enabling can be performed by external voltage source as well.

5. Load the outputs by resistive loads connected via jumpers:

- **J₅, J₇** – 51 Ω
- **J₆, J₈** – 1 k Ω

External loads can be used instead build-in resistive loads as well.



6. Monitor Output Voltages, given according to Equation 1.

$$V_{out_nom_n} = 1.275 \left(1 + \frac{R_{n1}}{R_{n2}} \right) \quad (\text{eq. 1})$$

7. Monitor Current Sense Output voltages on appropriate connector. They should be max 2.55 V in steady state. The CSO voltages are proportional to output currents according to Equation 2.

$$V_{CSO_n} = I_{out_n} \left(R_{CSO_n} \times \frac{1}{50} \right) \quad (\text{eq. 2})$$

8. Compare your results with measured results in **Table 2**.

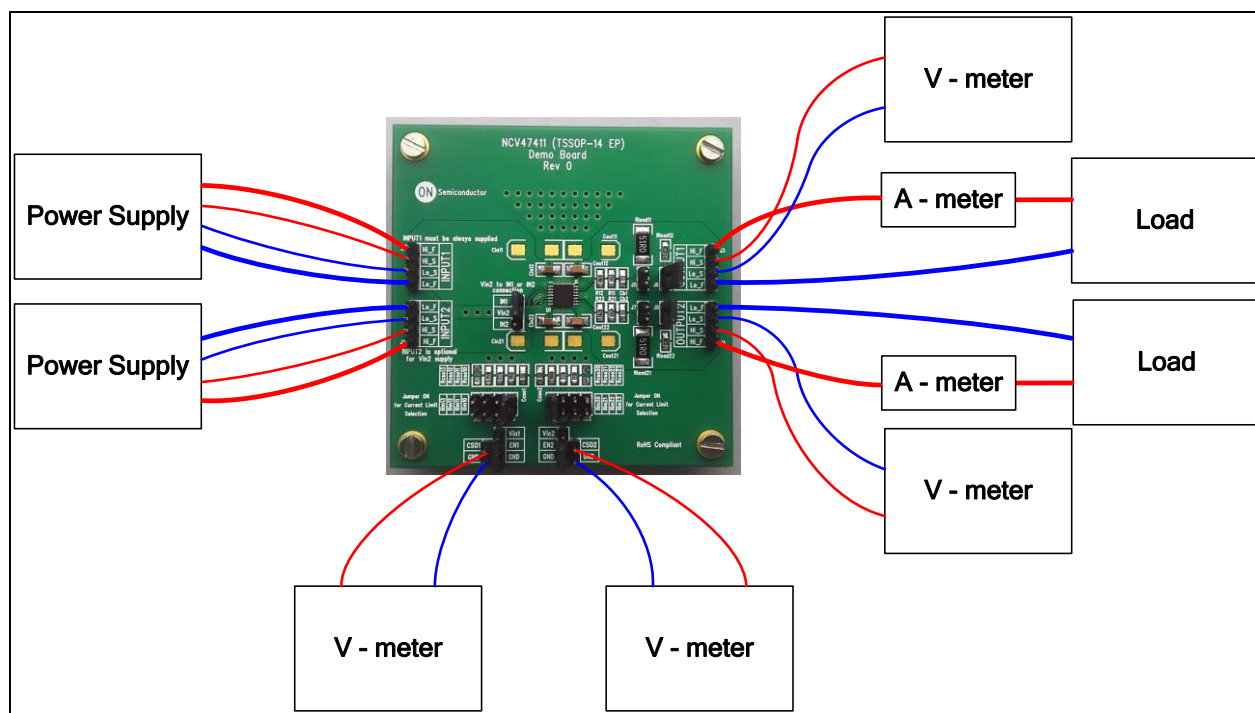


Figure 1. General Test Setup

Table 1: Required Equipment

Equipment	Ranges
Power Supply	0 V – 45 V / 1 A
Load	0 mA – 500 mA
V - meter	0 V – 20 V
A - meter	0 mA – 500 mA

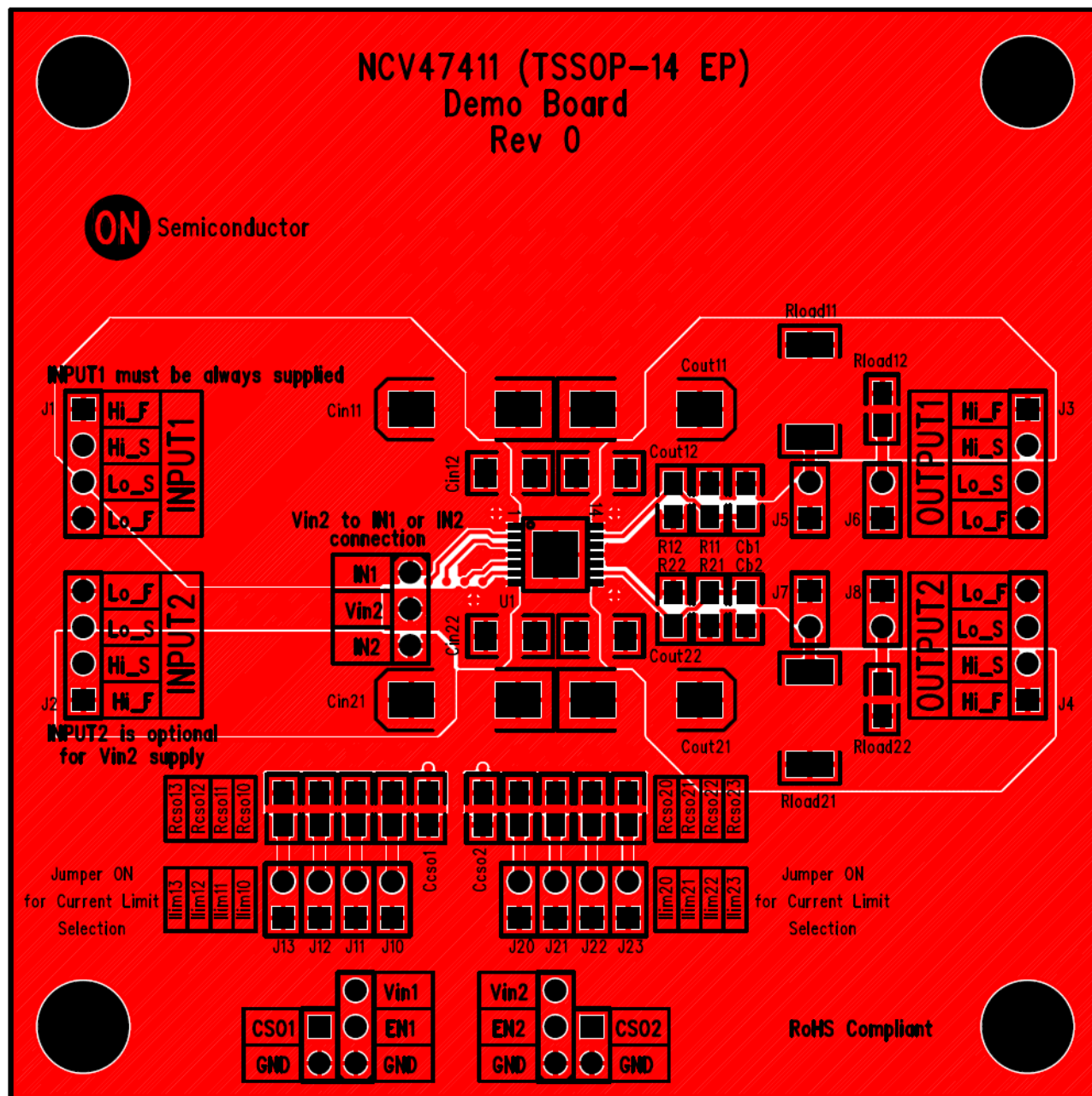


Figure 2. Top side PCB Layout (3 x 3 inch)

**Table 2: Measured Results**

Parameter	Test Conditions	Symbol	Value		Unit
			Nominal	Measured	
Output Voltage	$V_{in} = 13.5\text{ V}$, $V_{out_nom_n} = 5.02\text{ V}$, $I_{out_n} = 5\text{ mA}$, $R_{CSO_n} = \text{Short to ground}$	V_{out1}	5.02	5.006	V
		V_{out2}		5.005	
	$V_{in} = 13.5\text{ V}$, $V_{out_nom_n} = 5.02\text{ V}$, $I_{out_n} = 100\text{ mA}$, $R_{CSO_n} = \text{Short to ground}$	V_{out1}		5.005	
		V_{out2}		5.005	
Output Current	$V_{in} = 13.5\text{ V}$, $V_{out_nom_n} = 5.02\text{ V}$, $V_{out_n} = 90\%$ of $V_{out_nom_n}$, $R_{CSO_n} = 12.7\text{ k}\Omega$	I_{out1}	10.04	10.06	mA
		I_{out2}		10	
	$V_{in} = 13.5\text{ V}$, $V_{out_nom_n} = 5.02\text{ V}$, $V_{out_n} = 90\%$ of $V_{out_nom_n}$, $R_{CSO_n} = 2.49\text{ k}\Omega$	I_{out1}	51.2	52.47	
		I_{out2}		52.19	
	$V_{in} = 13.5\text{ V}$, $V_{out_nom_n} = 5.02\text{ V}$, $V_{out_n} = 90\%$ of $V_{out_nom_n}$, $R_{CSO_n} = 1.2\text{ k}\Omega$	I_{out1}	106.25	110.28	
		I_{out2}		109.95	
Output Current	$V_{in} = 13.5\text{ V}$, $V_{out_nom_n} = 5.02\text{ V}$, $V_{out_n} = 0\text{ V}$, $R_{CSO_n} = 12.7\text{ k}\Omega$	I_{out1}	10.04	10.55	mA
		I_{out2}		10.49	
	$V_{in} = 13.5\text{ V}$, $V_{out_nom_n} = 5.02\text{ V}$, $V_{out_n} = 0\text{ V}$, $R_{CSO_n} = 2.49\text{ k}\Omega$	I_{out1}	51.2	54.44	
		I_{out2}		54.17	
	$V_{in} = 13.5\text{ V}$, $V_{out_nom_n} = 5.02\text{ V}$, $V_{out_n} = 0\text{ V}$, $R_{CSO_n} = 1.2\text{ k}\Omega$	I_{out1}	106.25	115.32	
		I_{out2}		114.37	

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<http://moschip.ru/get-element>

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